

1    CLAIMS

2    What is claimed is:

3    1. A method for filtration of wastewater within a filtration system comprising multiple  
4 filter units, the method comprising:

5    a. operating fewer than all units within the filtration system in a filtration-only mode;  
6 and

7    b. simultaneously operating the remaining units in a denitrification mode.

1    2. A method for filtration of wastewater within a filtration system comprising multiple  
2 filter units, the method comprising:

3    a. selecting one or more filter units to operate in a denitrification mode;

4    b. pumping a carbon source to the one or more filter units selected in step (a);

5    c. operating the filter units selected in step (a) in denitrification mode until desired NO<sub>X</sub>-  
6 N level is attained; and

7    d. operating the remaining filter units in a filtration-only mode.

1    3. The method for filtration of claim 2 wherein the flow rate of the carbon source to the  
2 one or more filter units is activated by a valve.

1    4. A method for filtration of wastewater within a filtration system comprising multiple  
2 filter units, the method comprising:

3    a. selecting one or more filter units to operate in a denitrification mode, each filter unit  
4 of the filtration system comprising a separate influent flow conduit;

5    b. charging a carbon source to each influent flow entering the filter units selected in step  
6 (a);

7    c. operating the filter units selected in step (a) in denitrification mode until desired  
8 NOX-N level is attained; and

9    d. operating the remaining filter units in a filtration-only mode.

1    5. The method of claim 4 wherein the influent flow conduit to each filter unit is an  
2 influent pipe.

1    6. The method of claim 4 wherein the influent flow conduit to each filter unit is an  
2 influent channel.

1        7. The method of claim 4 wherein the carbon source to each filter unit is directed to an  
2 influent chamber prior to entering the influent flow pipe.

1        8. The method of claim 4 wherein the carbon source is selected from a group of carbon  
2 sources comprising methanol, ethanol, acetic acid, brewery wastes, sugars, primary effluent  
3 and combinations thereof.

1        9. The method of claim 4 wherein the carbon source is diluted with clean water prior to  
2 charging the carbon source to the influent flows of the one or more filter units selected in step  
3 (a).

1        10. The method of claim 9 wherein the carbon source is injected directly into a clean  
2 water pipe, thoroughly mixed with clean water and diverted into each influent flow for the  
3 filter units selected in step (a).

1        11. The method of claim 4 wherein the carbon source is injected directly into influent  
2 flows entering the filter units selected in step (a).

1        12. A method for filtration of wastewater within a multi-mode filtration system  
2 comprising multiple filter units, the method comprising:

- 3        a. selecting one or more filter units to operate in a denitrification mode;
- 4        b. adjusting the influent flow rate of the one or more filter units selected in step (a) for  
5 denitrification operation;
- 6        c. pumping a carbon source to the one or more filter units selected in step (a);
- 7        d. operating the remaining filter units in a filtration-only mode;
- 8        e. operating the filter units selected in step (a) in denitrification mode until desired NO<sub>x</sub>-  
9 N level is attained.

1        13. A method for filtration of wastewater within a multi-mode filtration system  
2 comprising multiple filter units, the method comprising:

- 3        a. selecting one or more filter units to operate in a denitrification mode;
- 4        b. adjusting the influent flow rate of the one or more filter units selected in step (a) for  
5 denitrification operation;
- 6        c. pumping a carbon source to the one or more filter units selected in step (a);
- 7        d. adjusting the influent flow rate for the filter units in the filtration-only mode;

8       e. operating the filter units selected in step (a) in denitrification mode until desired NO<sub>x</sub>-  
9       N level is attained; and

10      f. operating the remaining filter units in a filtration-only mode.

1       14. The method of claim 13 wherein the influent flow rate for the denitrification operation  
2       in step (b) and the influent flow rate for the filtration-only operation are adjusted by use of  
3       one or more separate valve systems for each filter unit.

1       15. The method of claim 14 wherein each valve system comprises two or more flow  
2       control valves.

1       16. The method of claim 14 wherein the valve system comprises one or more  
2       proportioning valves.

1       17. The method of claim 14 wherein the valve system comprises a hydraulic flow control.

1       18. The method of claim 13 wherein the flow rate of the carbon source is adjusted by a  
2       solenoid valve.

1       19. A multi-mode filtration system comprising:

2           two or more filter units, each unit capable of operating in either a filtration mode or a  
3       denitrification mode;

4           each filter unit of the two or more filter units comprising a separate influent flow and  
5       a separate flow control system; and

6           a carbon source pump and piping for directing the carbon source to the two or more  
7       filter units as needed, the piping including a separate feed pipe for each filter unit so that the  
8       carbon source is fed only to the filter units selected for operating in the denitrification mode.

1       20. The filtration system of claim 19 further comprising an influent pipe for containing  
2       the influent flow for each filter unit.

1       21. The filtration system of claim 19 further comprising an influent channel for containing  
2       the influent flow for each filter unit.

1       21. The filtration system of claim 19 further comprising an influent chamber for  
2       containing the carbon source for each filter unit.

1       22. A multi-mode filtration system comprising multiple filter units, the method  
2       comprising:

3           two or more filter units capable of operating in either filtration mode or denitrification  
4       mode;

5           each filter unit of the two or more filter units comprising a separate influent flow;

6           each filter unit comprising a valve control system for regulating the influent flow to  
7       the filter unit; and

8           a carbon source pump and piping capable of directing the carbon source directly to  
9       any one unit of the two or more filter units.

1       23. The filtration system of claim 22 wherein the valve control system for each filter unit  
2       comprises two or more flow control valves.

1       24. The filtration system of claim 22 wherein the valve control system comprises one or  
2       more proportioning valves.

1       25. The filtration system of claim 22 wherein the valve control system comprises a  
2       hydraulic flow control.

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